

## ABSTRACT

Methods of Controlling Communication Parameters of Wireless  
Systems

5 The present invention provides a method for controlling a communication parameter in a channel through which data is transmitted between a transmit unit with M transmit antennas and a receive unit with N receive antennas by selecting from among proposed mapping schemes an applied mapping scheme according to  
10 which the data is converted into symbols and assigned to transmit signals  $TS_p$ ,  $p=1..M$ , which are transmitted from the M transmit antennas. The selection of the mapping scheme is based on a metric; in one embodiment the metric is a minimum Euclidean distance  $d_{min,rx}$  of the symbols when received, in another  
15 embodiment the metric is a probability of error  $P(e)$  in the symbol when received. The method can be employed in communication systems using multi-antenna transmit and receive units of various types including wireless systems, e.g., cellular communication systems, using multiple access techniques  
20 such as TDMA, FDMA, CDMA and OFDMA.

**ABSTRACT**

**Methods of Controlling Communication Parameters of Wireless Systems**

The present invention provides a method for controlling a communication parameter in a channel through which data is transmitted between a transmit unit with  $M$  transmit antennas and a receive unit with  $N$  receive antennas by selecting from among proposed mapping schemes an applied mapping scheme according to which the data is converted into symbols and assigned to transmit signals  $TS_p$ ,  $p=1...M$ , which are transmitted from the  $M$  transmit antennas. The selection of the mapping scheme is based on a metric; in one embodiment the metric is a minimum Euclidean distance  $d_{min,rx}$  of the symbols when received, in another embodiment the metric is a probability of error  $P(e)$  in the symbol when received. The method can be employed in communication systems using multi-antenna transmit and receive units of various types including wireless systems, e.g., cellular communication systems, using multiple access techniques such as TDMA, FDMA, CDMA and OFDMA.